



US006386593B1

(12) **United States Patent**
Slais et al.

(10) **Patent No.:** US 6,386,593 B1
(45) **Date of Patent:** May 14, 2002

(54) **DUAL-PLANE SEAL FOR FLUID-TIGHT CONDUIT CONNECTION**

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(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/430,507

(22) **Filed:** Oct. 29, 1999

(51) **Int. Cl.⁷** F16L 17/025

(52) **U.S. Cl.** 285/205; 277/626; 277/609; 285/124.1

(58) **Field of Search** 285/205, 124.1, 285/FOR 118; 277/592, 595, 609, 627, 598, 626

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,152,630 A * 4/1939 Balfe
3,042,248 A * 7/1962 Krueger
3,053,544 A * 9/1962 Gorsica
3,099,456 A * 7/1963 Hopp
3,275,348 A * 7/1966 Scott

4,103,901 A * 8/1978 Dutcher
4,676,515 A * 6/1987 Cobb 277/235
4,796,896 A * 1/1989 Anderson, Jr.
5,174,612 A * 12/1992 Schnell 285/205
5,228,702 A * 7/1993 Browne et al.
5,375,851 A * 12/1994 Mockenhaupt
5,544,902 A * 8/1996 Belter
5,556,138 A * 9/1996 Nakajima et al. 285/205
5,853,201 A * 12/1998 Izumi et al. 285/205
5,958,571 A * 9/1999 Omura
6,027,125 A * 2/2000 Guest

* cited by examiner

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(57) **ABSTRACT**

A dual-plane sealing configuration for a fluid-tight conduit connection that incorporates additional sealing areas and minimizes assembly misalignment. A gasket is mounted around a conduit, sandwiched between an end-form block and a receiver, and compressed therebetween using a fastener fitted through the end-form block and threaded into the receiver. The gasket has a formed pilot that pilots around the conduit and is sandwiched between the conduit and a chamfer in the receiver to establish a secondary seal. The gasket incorporates features such as a fold-over tab and a non-uniform embossment to counteract the cantilever behavior of the conduit connection.

20 Claims, 5 Drawing Sheets

